

2.2 Analyze Conditional Statements

CONDITIONAL STATEMENT: a logical statement that has two parts, a hypothesis and a conclusion.

↓
if part

↓
then part

Ex. IF it is raining, then there are clouds in the sky.
hypothesis conclusion

Rewrite the statements in if-then form.

Ex 1. All birds have feathers.

If an animal is a bird, then it has feathers.

Ex 2. Two angles are supplementary if they are a linear pair.

If two angles are a linear pair, then they are supplementary.

NEGATION: the opposite of the original statement

Ex. Statement: The ball is red.

ASK FOR OBJECT
ASK FOR COLOR

Negation: The ball is not red.

CONVERSE: ~~switch~~ switch the hypothesis & conclusion

INVERSE: NEGATE BOTH THE HYPOTHESIS & CONCLUSION

CONTRAPOSITIVE: NEGATE BOTH the hypothesis & conclusion of the converse.

TRUE CONDITIONAL STATEMENT IF $m\angle A = 22^\circ$, then $\angle A$ is acute.

FALSE CONVERSE IF $\angle A$ is acute, then $m\angle A = 22^\circ$.

FALSE INVERSE IF $m\angle A \neq 22^\circ$, then $\angle A$ is not acute.

TRUE CONTRAPOSITIVE IF $\angle A$ is not acute, then $m\angle A \neq 22^\circ$.

WRITE THE if-then form, converse, inverse, contrapositive.

EX 3: "GUITAR PLAYERS ARE MUSICIANS"

ASK FOR A MUSICAL INSTRUMENT
OR SPORT

- TRUE If-then IF you are a guitar player, then you are a musician.
F Converse If you are a musician, then you are a guitar player.
F Inverse If you are not a guitar player, then you are not a musician.
T Contrapositive If you are not a musician, then you are not a guitar player.

EQUIVALENT STATEMENTS: when two statements are both true or both false

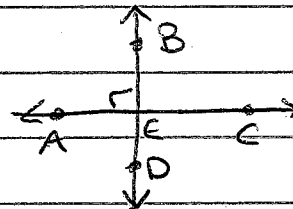
CONDITIONAL STATEMENT $\frac{1}{2}$ CONTRAPOSITIVE ARE EQ. STATEMENTS

CONVERSE $\frac{1}{2}$ INVERSE ARE EQ. STATEMENTS.

DECIDE WHETHER EACH STATEMENT ABOUT THE DIAGRAM IS TRUE.
EXPLAIN USING THE DEFINITIONS WE HAVE LEARNED.

A. $\overleftrightarrow{AC} \perp \overleftrightarrow{BD}$

TRUE THE LINES INTERSECT
TO FORM A RIGHT ANGLE.



B. $\angle BEA$ and $\angle CED$ are vertical angles.

TRUE THEIR SIDES ARE ~~OPPOSITE RAYS~~ FORM TWO PAIRS OF
OPPOSITE RAYS

C. $\angle BEC$ AND $\angle CED$ are complementary

FALSE $\frac{\text{sum of}}{m \angle BEC} \frac{1}{2} m \angle CED \neq 90^\circ$.

Homework: p. 82 #1, 3-18 ALL